

(12) UK Patent Application (19) GB (11) 2 235 154 (13) A

(43) Date of A publication 27.02.1991

(21) Application No 8916076.6

(22) Date of filing 13.07.1989

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(51) INT CL⁵
B28D 1/04

(52) UK CL (Edition K)
B5L LCS 1102
U1S S1382 S1695

(56) Documents cited
 None

(58) Field of search
 UK CL (Edition J) B3D DFKX, **B5L LCS**
 INT CL⁴ **B23D, B24B, B28D**

(54) Sawing apparatus

(57) In sawing apparatus having a circular saw blade 16 which is movable along a path across a saw bed 15 on which a member such as a concrete beam to be sawn is placed, there are provided removable barrier means 41, 42 located on each side of said path of travel of the saw blade to define a fluid bath so that the portion of the member to be sawn is immersed in said bath, fluid input means for filling said bath with a fluid and fluid discharge means for emptying said bath of said fluid, the bath being filled with fluid prior to sawing such that during movement of the saw blade along said path the blade is partially immersed in said bath.

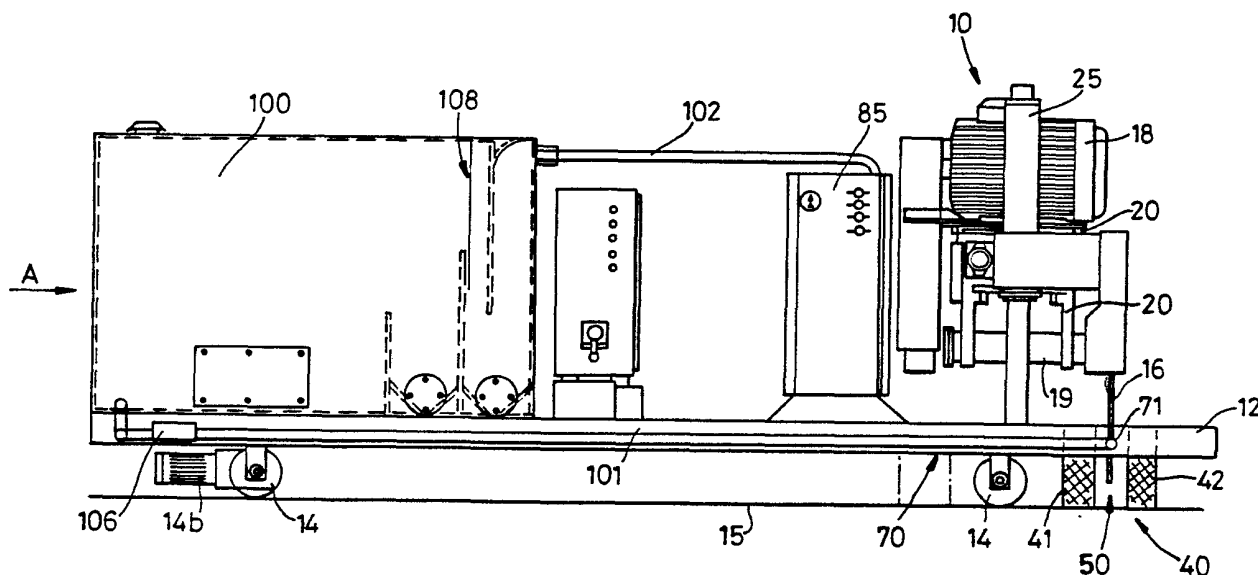


Fig. 1

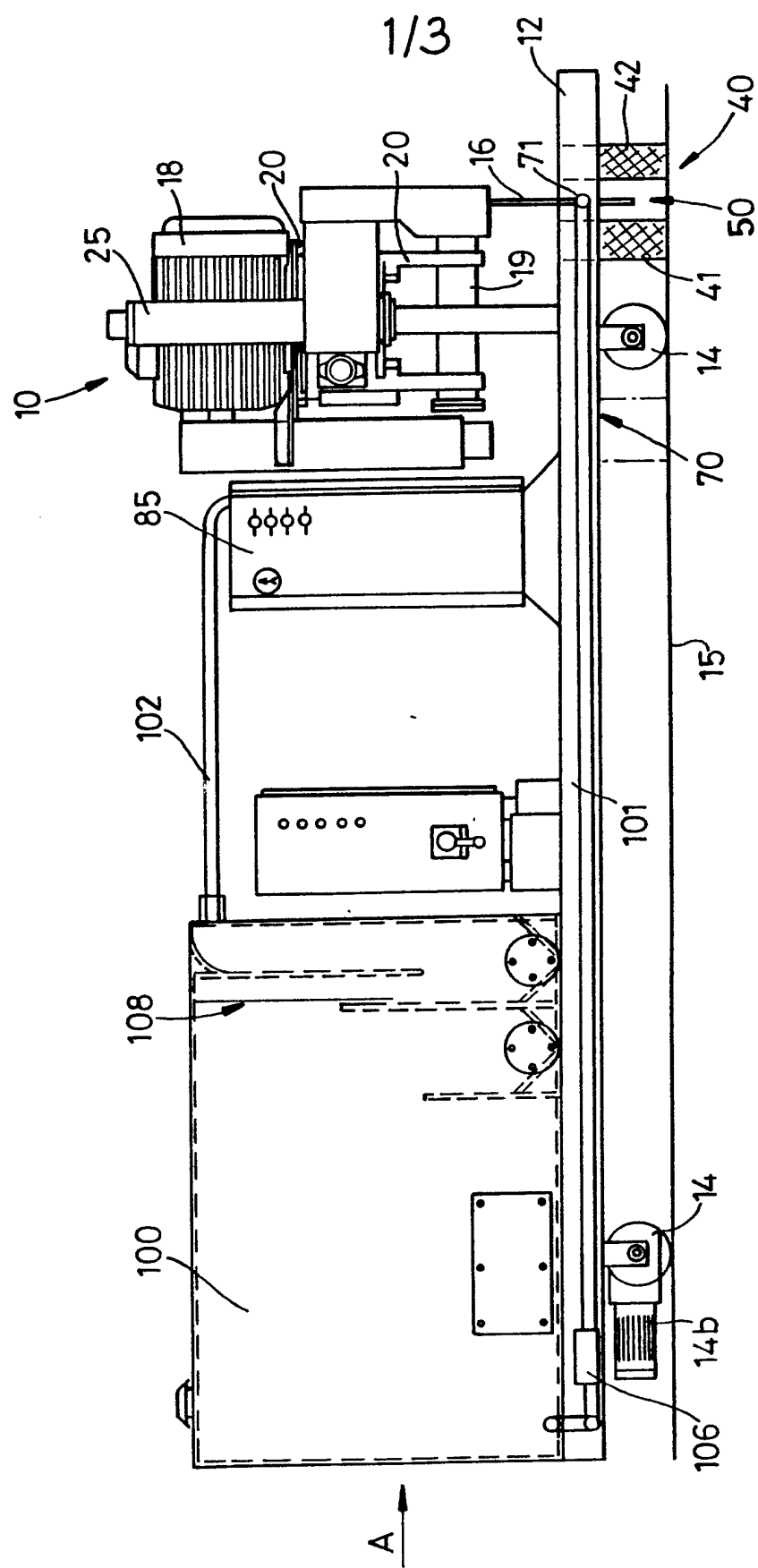
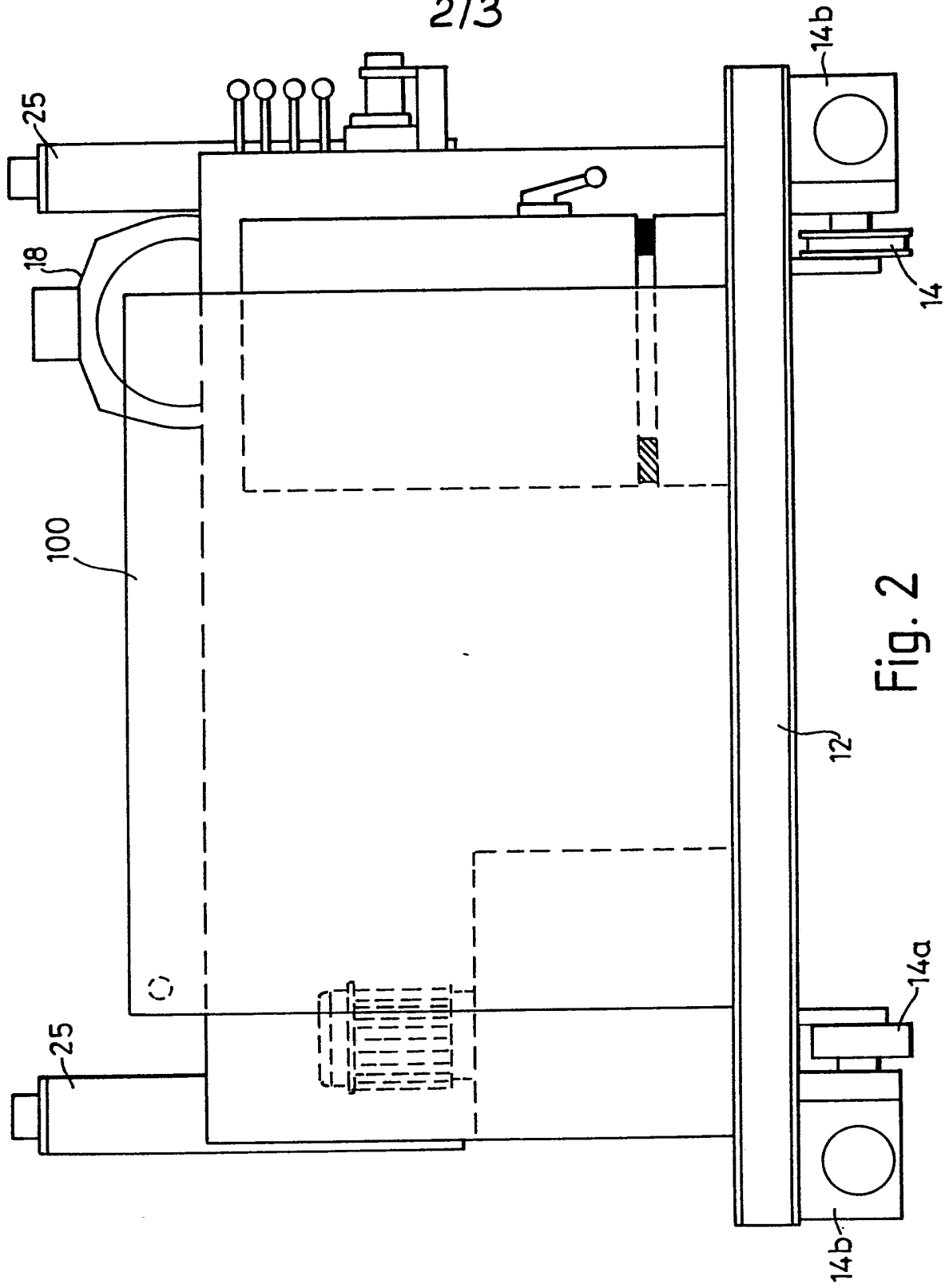


Fig. 1



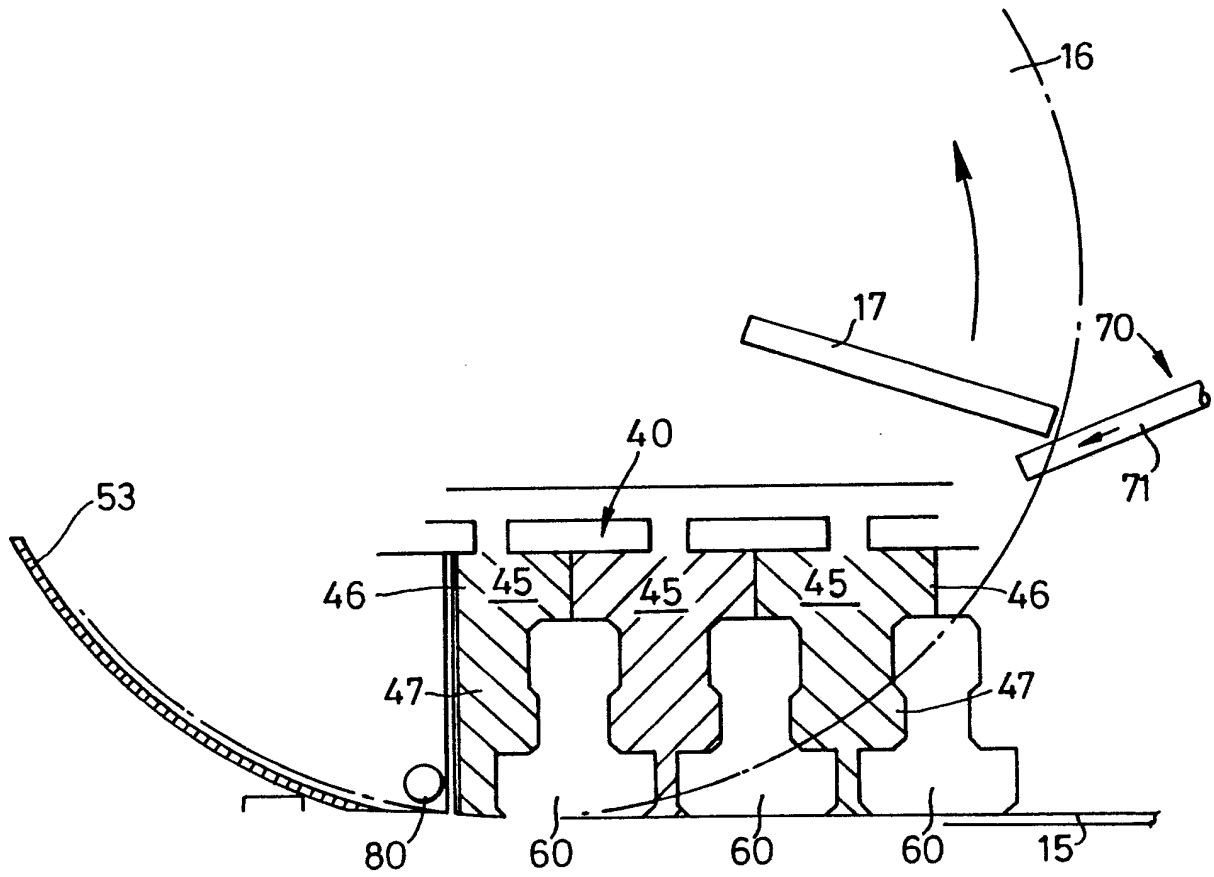


Fig. 3

A SAW

1.

The present invention relates to a saw, in particular a mobile saw capable of cutting lengths of prestressed concrete beams.

In the manufacture of prestressed concrete beams, long curing platforms are provided on which long lengths of prestressed concrete beams are cast and cured. After curing a mobile saw moves along the curing platform and at predetermined locations the saw is operated to cut a desired length of beam.

Such saws tend to use circular saw blades which are prone to create a great deal of dust and noise. In addition the saw blades generate a great deal of heat and so it is common to provide a coolant, such as water, which is sprayed onto the blade to keep it cool. This is desirable since excessive heating of the saw blade shortens its effective life. Spraying of water on to the saw blade does however have a drawback in that the waste water after having left the saw blade is deposited on the curing bed and surrounding area and so makes it difficult to maintain a relatively clean working environment. Spraying of water on to the blade does not effectively prevent the creation of dust.

According to one aspect of the present invention there is provided a saw having a circular saw blade which is movable along a path across a saw bed on which a member to be sawn is placed, the saw including removable barrier means which define a fluid bath adjacent to said path of travel of the saw blade so that the portion of the member to be sawn is immersed in said bath, fluid input means for filling said bath with a fluid and fluid discharge means for emptying said bath of said fluid, the bath being filled with fluid prior to sawing such that during movement of the saw blade along said path the blade is partially immersed in said bath.

The provision of the removable barrier means enables a bath to be temporarily erected for a sawing operation and then removed for the next member to be sawn. Since during sawing the blade is partially immersed in a bath of fluid, sound dampening occurs, cooling of the blade occurs and dust suppression is achieved. In addition since the fluid is held in a bath it is captured and can be drained away by said fluid discharge means prior to the next sawing operation and thus enables a relatively clean working environment to be maintained. Additionally, if desired the fluid can be recirculated for repeated use. Thus there is a relative low wastage of fluid.

Various aspects of the present invention are hereinafter described with reference to the accompanying drawings, in which:-

Figure 1 is a side view of a saw according to the present invention.

Figure 2 is an end view of the saw shown in Figure 1 looking in direction A.

Figure 3 is a schematic view taken along line II-II in Figure 1.

The saw 10 illustrated in the drawings includes a mobile support frame 12 having wheels **14,14a** for enabling the support frame 12 to move along a curing bed 15 (shown only partially in Figure 3). A pair of motors 14b is provided for driving the rear pair of wheels **14,14a**.

The saw 10 includes a saw blade 16 driven by a motor 18. The saw blade 16 is mounted on a rotatable shaft 19 which is mounted in a carriage 20. The motor 18 is also mounted on the carriage 20. The carriage 20 is mounted on cross-slides (not shown) which in turn are mounted on a pair of vertical rams 25. Accordingly, the saw blade 16 may be raised and lowered

relative to the curing bed **15** by operation of rams 25 and may also be moved along a path across the bed by movement of the carriage **20** along the cross-slides.

Removable barrier means **40** are provided which are mounted on the support frame **12** and depend there from toward the curing bed 15.

The barrier means **40** are shown schematically in Figure 1 and include first and second barrier walls **41,42** respectively which are spaced apart so as to extend along and either side of the path of travel of the saw blade 16.

The barrier walls **41,42** are adapted to envelope the members 60 to be sawn and provide a fluid seal therewith such that the space between the barrier walls **42** can be filled with fluid. Accordingly the barrier walls **41,42** effectively form the side walls of a bath 50 in which the portion of the members 60 to be sawn is immersed.

As illustrated in Figure 3 each barrier wall **41, 42** comprises a series of individual inflatable bags **45**. Each bag **45** has an upper portion **46** which on inflation sealingly abuts a neighbouring bag and a lower portion 47 which sealingly engages opposed sides of neighbouring members 60.

To achieve an effective fluid seal the bags 45 may be formed from a relatively inelastic material which is preshaped to conform with the contours of members 60 or alternatively the bags 45 may be formed from a relatively elastic material which on inflation conforms to the contours of the opposed sides of the members 60.

A fluid input means 70 is provided for filling the bath 50 with a fluid. The walls **41,42** extend about the members 60 and so those portions to be sawn are totally immersed.

Fluid is introduced into the bath 50 via a pipe 71 and is preferably continuously supplied during the sawing operation.

One end of the bath 50 is preferably defined by a saw blade cowling 53 which is movable to engage opposed ends of walls **41,42** prior to initiation of the sawing operation. A movable wall member (not shown) is similarly movable to engage the opposite **ends of** walls **41,42** to thereby define the opposite end of the bath 50.

A fluid discharge opening 80 is preferably formed in cowling 53 so that once the bath has been filled to a desired level above members 60 fluid can be continuously withdrawn from the bath whilst fluid is continuously supplied by the

fluid input means 70. In this way a flow of fluid along the bath 50 is achieved and this assists in removing sludge created during the sawing operation.

On completion of the sawing operation the fluid input means 70 stops supplying fluid and fluid is withdrawn from the bath via the discharge opening 80. The majority of fluid is removed from the bath due to the existence of the saw cut which has just been created which provides fluid communication between the spaces inbetween adjacent members 60.

The bags 45 are then deflated which effectively removes the **barrier** means and enables the saw to be advanced along the curing bed to the next sawing position.

Inflation/deflation of the bags is conveniently achieved by valve means (now shown) which selectively connect the bags to either the positive (for inflation) or negative (for deflation) pressure side of a fan (now shown) housed in a cabinet 85. Accordingly the medium for inflating the bags is preferably air. It will be appreciated however that other gases or liquids may be used.

The fluid is stored in a tank **100** mounted on the support frame **12**. A conduit **101** is provided for drawing fluid from the tank **100** and supplying fluid to the pipe 71. A pump 106 is provided for causing flow along conduit **101**. A conduit **102** is provided for drawing fluid from the discharge opening **80** and supplying the fluid into the tank 100. Accordingly a closed fluid circuit is provided which is economical on the use of fluid. The tank **100** preferably includes a settlement section **108** in which sludge may settle out. A pair of wiper blades 17 are provided (only one of which is visible) for reducing removal of fluid from the bath by the saw blade **16**.

Preferably the fluid which is used is water or water including additives such as lubricants. Other fluids, such as oil, may be used if desired.

It is envisaged that the barrier walls **41,42** may be constructed differently and still perform the same function. For instance it is envisaged that the bags **45** may be replaced by rotatable flaps which are rotatable about a vertical axis. Thus in one rotation position the flaps extend in the direction of the path of travel of the saw blade and co-operate to collectively form the barrier walls **41,42** and in another rotational position extend generally in the direction

of travel of the saw **along the** curing **bed** and thereby **enable** the saw to be moved there along without the flaps engaging the members **60**.

In a further alternative the barrier walls **41,42** may **be** movable between a raised position whereat they are clear of the members **60** and a lowered position whereat they envelope the members **60** to define the bath.

The fluid seal between the barrier walls **41,42** and the members **60** does not have to be highly efficient as a certain amount of leakage can be tolerated by appropriate adjustment of the relative rates of flow of fluid through the inlet pipe **71** and discharge opening **80**.

Although the above saw has been described in relation to the sawing of prestressed concrete beams it will be appreciated that the saw may be used to saw other materials.

CLAIMS

1. A **saw** having a circular saw blade which is movable along a path across a saw bed on which a member to be sawn is placed, the saw including removable barrier means which define a fluid bath adjacent to said path of travel of the saw blade so that the portion of the member to be sawn is immersed in said bath, fluid input means for filling said bath with a fluid and fluid discharge means for emptying said bath of said fluid, the bath being filled with fluid prior to sawing such that during movement of the saw blade along said path the blade is partially immersed in said bath.
2. A saw according to claim 1 wherein the barrier means includes a pair of erectable barrier walls extending either side of said path of travel.
3. A saw according to claim 2 wherein each barrier wall comprises a series of barrier members which are movable between a first position whereat the barrier members cooperate with one another and with the member to be sawn to create a fluid barrier and a second position whereat the barrier members are spaced from one another and said member to be sawn to permit relative movement between the saw and the member to be sawn.

4. A saw according to claim 3 wherein the barrier members comprise inflatable bags which are movable between said first and second positions by response to inflation and deflation.

5. A saw according to claim 3 wherein the barrier members comprise rotatable flaps which are rotatably movable between said first and second positions.

6. A saw according to claim 5 wherein the flaps include seal means extending about their periphery.

7. A saw according to any preceding claim including a mobile support frame on which the saw is mounted.

8. A saw according to claim 7 wherein the mobile support frame is mounted on an elongate platform upon which members to be sawn are supported.

9. A saw substantially as described and as illustrated in the accompanying drawings.

10. A stressed concrete beam curing platform including a saw according to any preceding claim.